



AAR-100

Human Factors Newsletter # 02-18

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Project Report - Task-Based Vision Requirements for Aircraft Inspection Personnel

The Federal Aviation Administration (FAA) Airworthiness requirement entitled “Vision Testing Requirements for Certain Persons Maintaining and Inspecting Aircraft and Aircraft Components” states, at a minimum, to determine standards for near and far vision and color perception in aircraft inspectors. An FAA Advisory Circular AC#65-31 recommended examination guidelines for the vision of non-destructive inspection personnel, however additional research is needed to understand how degraded visual processes affect task performance. The Advisory Circular states that near vision in at least one eye must be 20/25 and distance vision in at least one eye must be 20/50 (both near and far requirements may be with corrected or uncorrected vision). Color vision guidelines state that the inspector must: “distinguish and differentiate between colors necessary for the inspection method for which evidence of qualification is sought.” Research is underway to determine what are the minimum standards for stereo acuity, peripheral vision, contrast sensitivity, visual fields, eye disorders, eye diseases, medication effects, corrective lenses, colored lenses, age effects, and other vision related processes that are acceptable vision standards for personnel involved in nondestructive inspection and testing and visual inspection of aircraft and aircraft components. The goal of this research project will be to develop specific minimum visual requirements for essential tasks nondestructive inspection and testing and visual inspections which Flight Standards can use to write a medical standard similar to Part 67 for pilots. To accomplish this goal, aviation maintenance personnel will view typical structural defects in airframes that will be degraded with various visual deficits. This degradation will be accomplished through video simulation that is a well-controlled, validated psychophysical paradigm currently used in medicine to investigate tumor detection by physicians. By adopting this experimental paradigm, research will be able to determine at what level of visual deficit a maintenance or inspection worker would become unable to perform the critical visual tasks required by the job in a safe and efficient manner”. (K. Krebs, AAR-100; <mailto:william.krebs@faa.gov>)

New AAR-100 Deputy: Dr. Paul Krois has been selected as the Deputy Division Manager for AAR-100, Office of the Chief Scientific and Technical Advisor for Human Factors. Dr. Krois brings a wealth of talent and experience to the new position in AAR, so please join in welcoming him in his new capacity.

Advanced Qualification Program (AQP): Researchers from the Air Transportation Human Factors program presented several topics to the Industry AQP meeting held in Seattle earlier this month. Dr. Florian Jentsch (University of Central Florida) presented an update on Rapidly Reconfigurable Line Oriented Evaluations, and Dr. Susan Mangold (Battelle) presented the latest Model AQP developments to the working group as well as the general audience. Both presentations generated widespread interest and resulted in several new carriers wanting to adopt these tools. Also, it was announced that Airborne Express will come on board as a partner in FAA research being conducted at the University of Central Florida. Dr. Peder Johnson and Dr. Timothy Goldsmith (University of New Mexico) made a presentation on instructor evaluator training to the instructor/evaluator working group. Dr. David Baker (American Institutes for Research – ARI) presented the final results of the airline training survey. Several airlines that participated in the survey requested their individual airline responses. ARI will provide these carriers with the data. Katie Van Drie (Battelle), who is collecting lessons-learned on AQP development with the intention of writing a handbook for new entrants, presented her survey. These presentations represented a large portion of the entire agenda for the 2-day meeting that was attended by over 150 airline representatives. (E. Edens, AFS-230)

Human Factors in FAST: The FAA Acquisition System Toolset (<http://fast.faa.gov/>) contains authoritative information about many important areas of system acquisition including human factors references for job guidelines, human factors special topics for Investment Analysis Teams, human factors process flowcharts, and various links to policy and the human factors Web site (<http://www.hf.faa.gov>). For example, those participating in the acquisition of systems, services, or facilities might benefit from the guidelines provided in the FAA Human Factor Job Aid, which addresses topics/activities such as:

- Develop Human Factors Inputs for Acquisition Documentation
- Develop the Human Factors Program
- Formulate Human Factors in System Specifications
- Generate Human Factors Requirements in the Statement of Work
- Specify Human Factors in Source Selections
- Integrate Human Factors in System Engineering
- Determine Human Factors Requirements in System Testing
- Coordinate with the Integrated Logistics Support Program

If you have any questions about human factors in FAST, please visit <http://fast.faa.gov> (T. Kraus, AAR-200)

Human Factors Researcher Wins National Award: The American Psychological Association (APA) announced recently that Florian Jentsch, Ph.D., from the University of Central Florida in Orlando was awarded the 2002 Earl A. Alluisi Award for Early Career Achievement for his contributions to aircrew training and assessment. Dr. Jentsch received the award from APA's Division for Applied and Experimental Psychology in recognition of his work on FAA-funded research projects in the areas of simulation and advanced training design which he has been conducting for AAR-100 and AFS-230 since 1997, together with his colleagues at UCF, Drs. Clint Bowers and Eduardo Salas. This is the second time that FAA-funded work conducted by Dr. Jentsch has received national recognition; his doctoral dissertation on new training methods

for junior first officers received the 1998 George E. Briggs Dissertation Award from the American Psychological Association. (E. Edens, AFS-230)

Women-Owned Business Award: Research Integrations Inc. has been selected as this year's recipient of the Department of Transportation Women-Owned Business Entrepreneur Award. The award will be presented Oct. 28 at 2:00 P.M. in the 3rd floor auditorium as part of the DOT Minority Enterprise Development Week award ceremony. The company is developing the human factors certification job aid, a software decision support tool designed to assist certification and design personnel in identifying, assessing, and resolving potential design-induced human performance errors that could contribute to aviation incidents and accidents. In the current version, the information in the databases is focused on CFR Part 25 flight deck displays. During FY03, the databases will be expanded to address controls. The company is also providing technical, analytical and planning support to the FAA for the implementation of activities essential to development of VHF Data Link Mode 3 (VDL-3) avionics and the participation of commercial air carriers in the Next Generation Communication (NEXCOM) System Demonstration. In the area of air transportation human factors, Research Integrations is conducting research using simulation to identify and measure pilot skills for automated aircraft. (T. McCloy, AAR-100)

Air Transportation Human Factors: The fourth quarter FAA Flight Program Participant's Safety meeting was held on October 17, 2002 at Reagan National Airport. The discussion topic was "Detecting and Correcting In-Flight Errors". The secondary topic was flight crew composition and culture. The presenter was Dr. Ute Fische of Georgia Institute of Technology. After earning her Ph.D. in Cognitive Psychology from Princeton University, Dr. Fische has conducted research in naturalistic decision-making, focusing on aviation flight crews. Her work has examined crew decision-making processes, effective communication strategies, and the role of cognitive and contextual factors in decision errors associated with aviation accidents and incidents. Her current projects concern individual and organizational risk management, as well as the effect of culture and gender on the interaction and decision strategies of small teams, such as flight crews and mission specialists. The meeting is designed for pilots and crewmembers in the Headquarters' Flight Program. (E. Edens, AFS-230)

More information on human factors research can be found at the FAA Human Factors (AAR-100) web site: <http://www.hf.faa.gov>

Mark D. Rodgers
FAA (AAR-100)



October 21-24, 2002 – 2nd Annual FAA Centers of Excellence Meeting, Wichita, KS
<http://www.niar.twsu.edu/faacoe>

October 23-25, 2002 – International Conference on Human-Computer Interaction in Aeronautics, Massachusetts Institute of Technology, Cambridge, MA <http://www-eurisco.onecert.fr/events/hci-aero2002.html/>

October 23-25, 2002 – SAE AC-9 Aircraft Environmental Systems Committee, Albuquerque, NM <mailto:elizd@sae.org>

October 27-31, 2002 – 21st Digital Avionics Systems Conference, Hyatt Regency Hotel, Irvine, CA <http://www.dasconline.org/>

November 4-7, 2002 – 55th Annual Air Safety Seminar “Keeping Safety a Worldwide Priority”, a Joint Meeting of the Flight Safety Foundation, International Federation of Airworthiness, and International Air Transport Association, Citywest Hotel, Dublin, Ireland
wahdan@flightsafety.org.

November 5-7, 2002 – SAE World Aviation Congress and Display, Sheraton Crescent Hotel, Phoenix, AZ <http://www/sae.org/calendar/aeromtg.htm>

November 19-20, 2002 - FAA/NASA IAIPT Human Factors Technical Interchange Meeting on Role of Human Factors in Progressing Capabilities Through R&D to Acquisition and Deployment, William J. Hughes Technical Center, Atlantic City, NJ <mailto:paul.krois@faa.gov>

November 21-24, 2002 – 43rd Annual Meeting of the Psychonomic Society, Hyatt and Westin Hotels, Kansas City, MO <mailto:psp@psychonomic.org>

December 10-14, 2002 – Neural Information Processing Systems 2002, Vancouver, Canada
<http://www.nips.cc/>

January 13-17, 2003 – SAE S-18 Airplane Safety Assessment Committee, Salt Lake City, UT
<mailto:lemon@sae.org>

January 14-16, 2003 – SAE Aircraft Seat Committee, San Diego, CA <mailto:elizd@sae.org>

January 27-31, 2003 – SAE G-10 Aerospace Behavioral Engineering Technology Committee, Melbourne, FL <mailto:lemon@sae.org>

February 4-6, 2003 – SAE North American Aviation Safety Conference, Atlanta, GA
<http://www/sae.org/calendar/aeromtg.htm>

March 3-6, 2003 – SAE 2003 World Congress, Cobo Center, Detroit, MI
<http://www/sae.org/congress/index.htm>

March 17-19, 2003 – 15th Annual European Aviation Safety Seminar presented by the Flight Safety Foundation and European Regions Airlines Association, Hotel Intercontinental Geneva, Geneva, Switzerland <http://www.flightsafety.org/seminars.html>

March 24-28, 2003 – SAE Airplane Safety Assessment Committee, Lisbon, Portugal
<mailto:lemon@sae.org>

April 2-8, 2003 – Sun ‘n Fun EAA Fly In, Lakeland, FL <http://www.sun-n-fun.org>

April 5-10, 2003 – CHI 2003 Conference on Human Factors in Computing Systems, Broward Convention Center, Ft. Lauderdale, FL <http://www.chi2003.org/>

April 7-27, 2003 – Aviation World’s Fair, Newport News/Williamsburg, VA
<http://www.worlds-fair.com/> or <http://aviation-worlds-fair.com/>

April 9-11, 2003 – SAE Aircraft Environmental Systems Committee, Dayton, OH
<mailto:elizd@sae.org>

April 22-23, 2003 – 48th Annual Corporate Aviation Safety Seminar, presented by the Flight Safety Foundation and the National Business Aviation Association, Westin Diplomat Resort and Spa, Hollywood, FL <http://www.flightsafety.org/seminars.html>

April 27-30, 2003 – Symposium on Interactive 3D Graphics, Monterey Marriott, Monterey, CA
<mailto:Pausch@cmu.edu>

May 3-10, 2003 – International Conference on Software Engineering, Hilton Portland, Portland, OR <mailto:ldillon@cse.msu.edu>

May 4-9, 2003 – 74th Annual Scientific Meeting of the Aerospace Medical Association, Convention Center, San Antonio, TX <http://www.asma.org/>

May 12-17, 2003 - 2003 IEEE International Conference on Robotics and Automation, The Grand Hotel, Taipei, Taiwan <http://www.icra2003.org/>

June, 2003 – SAE Digital Human Modeling for Design and Engineering, Location TDB
<http://www/sae.org/calendar/aeromtgs.htm>

June 15-22, 2003 – 45th Paris Air Show le bourget <http://www.paris-air-show.com/index3.htm>

June 22-27, 2003 – 10th International Conference on Human-Computer Interaction, Institute of Computer Science Foundation, Research and Technology, Science and Technology Park of Crete, Heraklion, Crete, Greece <mailto:info@hcii2003.gr>

June 24-26, 2003 – Human Systems Integration Symposium “Enhancing Human Performance in Naval and Joint Environments”, Sheraton Premier Hotel, Tyson’s Corner, VA
<http://www.navalengineers.org/>

July 7-10, 2003 – SAE 33rd International Conference on Environmental Systems, The Westin Bayshore Resort and Marina, Vancouver, Canada <http://www.sae.org/calendar/aeromtgs.htm>

July 14-17, 2003 – AIAA/ICAS International Air & Space Symposium and Exposition, Dayton Convention Center, Dayton, OH <http://www.flight100.org/>

July 29-August 4, 2003 – 51st Annual AirVenture, Oshkosh, WI <http://airventure.org/>

August 7-10, 2003 – 111th Convention of the American Psychological Association, Toronto, Ontario, Canada <http://www.apa.org/convention>

September 9-11, 2003 – SAE Aerospace Congress and Exhibition, Palais des Congrès, Montreal, Quebec, Canada <http://www.sae.org/calendar/aeromtgs.htm>

October 13-17, 2003 – Human Factors and Ergonomics Society 47th Annual Meeting, Adams Mark Denver Hotel, Denver, CO <http://www.hfes.org/>

April, 2004 – SAE General Aviation Technology Conference and Exhibition, Century II Convention Center, Wichita, KS <http://www.sae.org/calendar/aeromtgs.htm>

July 27-August 2, 2004 – 52nd Annual AirVenture, Oshkosh, WI <http://airventure.org/>

May 2-7, 2004 – 75th Annual Scientific Meeting of the Aerospace Medical Association, Egan Convention Center, Anchorage, AK <http://www.asma.org/>

July 28 – August 1, 2004 – 112th Convention of the American Psychological Association. Honolulu, Hawaii <http://www.apa.org/convention>

September 20-24, 2004 – Human Factors and Ergonomics Society 48th Annual Meeting, Sheraton New Orleans Hotel, New Orleans, LA <http://www.hfes.org/>

Note: Calendar events in Italics are new since the last Newsletter



Comments or questions regarding this newsletter?
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